

CLAIM AMENDMENTS

Please cancel Claims 1, 34, and 36-42, and amend Claims 3, 5, 11, 13, 14, 17, 18, 22, 23, 27, 28, and 31-33 as follows with Claim 22 being withdrawn:

1. (canceled)
2. (canceled)
3. (currently amended) The method of any one of claims 31, 32, or 33 ~~claim 1~~, wherein said catalyst layer consists essentially of catalyst material.
4. (canceled)
5. (currently amended) The method of any one of claims 31, 32, or 33 ~~claim 1~~, wherein the superabrasive particle is diamond and the raw material is a carbon source.
6. (original) The method of claim 5, wherein said catalyst material is a member selected from the group consisting of Fe, Ni, Co, Mn, Cr, and alloys thereof.
7. (original) The method of claim 6, wherein said catalyst material is an Fe-Ni alloy having about 65 wt% Fe and about 35 wt% Ni.

8. (original) The method of claim 5, wherein said carbon source is graphite.
9. (original) The method of claim 8, wherein said graphite has a degree of graphitization of greater than 0.50.
10. (original) The method of claim 9, wherein said graphite has a degree of graphitization of from about 0.75 to about 1.
11. (currently amended) The method of any one of claims 31, 32, or 33 ~~claim 1~~, wherein the superabrasive particle is cubic boron nitride and the raw material is a hexagonal boron nitride source.
12. (original) The method of claim 11, wherein the catalyst material is a member selected from the group consisting of alkali, alkali earth metal, and compounds thereof.
13. (currently amended) The method of any one of claims 31, 32, or 33 ~~claim 1~~, wherein the crystalline seed is a member selected from the group consisting of diamond seed, cBN seed, SiC seed, and combinations thereof.
14. (currently amended) The method of any one of claims 31, 32, or 33 ~~claim 1~~, wherein the step of placing crystalline seeds includes placing the crystalline seeds in the raw material layer and the crystalline seeds are coated with a catalyst coating.

15. (original) The method of claim 14, wherein said raw material layer is a particulate source layer.
16. (original) The method of claim 14, wherein said catalyst coating is a catalyst metal selected from the group consisting of iron, nickel, cobalt, and alloys thereof.
17. (currently amended) The method of any one of claims 31, 32, or 33 ~~claim 1~~, wherein the step of placing crystalline seeds include placing the crystalline seeds in the catalyst layer.
18. (currently amended) The method of any one of claims 31, 32, or 33 ~~claim 1~~, wherein the step of placing crystalline seeds substantially surrounds each crystalline seed with catalyst material.
19. (original) The method of claim 18, wherein the step of placing crystalline seeds further comprises pressing the crystalline seeds partially into the catalyst layer and then forming a second catalyst layer on the catalyst layer such that each crystalline seed is substantially surrounded by catalyst material.
20. (original) The method of claim 18, wherein the step of placing crystalline seeds further comprises pressing the crystalline seeds completely into the catalyst layer such that each crystalline seed is substantially surrounded by catalyst material.

21. (canceled)
22. (currently amended and withdrawn) The method of any one of claims 31, 32, or 33 ~~claim 1~~, further comprising the steps of repeating the steps of forming layers and placing crystalline seeds at least one additional time to form a multi-layered growth precursor.
23. (currently amended) The method of any one of claims 31, 32, or 33 ~~claim 1~~, further comprising the step of heating and pressing the growth precursor to a temperature and pressure sufficient for growth of superabrasive particles to produce grown superabrasive particles.
24. (original) The method of claim 23, wherein the temperature is from about 1000 °C to about 1300 °C and the pressure is from about 4 to about 7 GPa.
25. (original) The method of claim 23, wherein the temperature is from about 10 °C to about 200 °C above a melting point of the catalyst.
26. (original) The method of claim 23, wherein said crystalline seeds have an average diameter from about 0.05 to about 0.2 times an average diameter of the grown superabrasive particles.
27. (currently amended) The method of any one of claims 31, 32, or 33 ~~claim 1~~, wherein said

crystalline seeds are from about 30 μm to about 500 μm in diameter.

28. (currently amended) The method of any one of claims 31, 32, or 33 ~~claim 1~~, wherein the predetermined pattern places crystalline seeds a distance of from about 400 μm to about 900 μm apart.

29. (original) The method of claim 28, wherein the superabrasive particles have a particle size from about 100 μm to about 2 mm.

30. (original) The method of claim 29, wherein the superabrasive particles have a particle size from about 210 μm to about 1 mm.

31. (currently amended) The method for controlling nucleation sites during superabrasive particle synthesis, comprising the steps of:

a) forming a raw material layer including a raw material;

b) forming a particulate catalyst layer adjacent the raw material layer to form a crystal growth layer, said particulate catalyst layer including a catalyst material; and

c) placing crystalline seeds in a predetermined pattern at least partially in at least one of the catalyst layer and the raw material layer to form a growth precursor, ~~of claim 1~~, wherein the step of placing crystalline seeds includes:

ai) placing a template having a pattern of apertures upon a surface of the crystal

growth layer, each of said apertures being configured to receive a single crystalline seed;

bii) filling the apertures of said template with the crystalline seeds; and

eiii) pressing said crystalline seeds at least partially into the crystal growth layer.

32. (currently amended) The method for controlling nucleation sites during superabrasive particle synthesis, comprising the steps of:

a) forming a raw material layer including a raw material;

b) forming a particulate catalyst layer adjacent the raw material layer to form a crystal growth layer, said particulate catalyst layer including a catalyst material; and

c) placing crystalline seeds in a predetermined pattern at least partially in at least one of the catalyst layer and the raw material layer to form a growth precursor, ~~of claim 1,~~ wherein the step of placing crystalline seeds includes:

ai) providing a transfer sheet having an adhesive layer thereon;

bii) placing a template having a pattern of apertures upon the adhesive layer, each of said apertures being configured to receive a single crystalline seed;

eiii) filling the apertures of said template with the crystalline seeds;

dii) placing the transfer sheet against a surface of the crystal growth layer; and

ev) pressing said crystalline seeds at least partially into the crystal growth layer.

33. (currently amended) The method for controlling nucleation sites during superabrasive particle

synthesis, comprising the steps of:

- a) forming a raw material layer including a raw material;
- b) forming a particulate catalyst layer adjacent the raw material layer to form a crystal growth layer, said particulate catalyst layer including a catalyst material; and
- c) placing crystalline seeds in a predetermined pattern at least partially in at least one of the catalyst layer and the raw material layer to form a growth precursor, of claim 1, wherein the step of placing crystalline seeds includes:

- ai) providing a vacuum chuck configured with a pattern of apertures;
- bii) pulling a vacuum through the apertures and engaging a single crystalline seed in each aperture;
- eiii) depositing the crystalline seeds on a surface of the crystal growth layer such that the crystalline seeds are arranged in a predetermined pattern corresponding to the pattern of apertures; and
- dii) pressing said crystalline seeds at least partially into the crystal growth layer.

34 - 42 (canceled)